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(56) Documents Cited

GB 2306151 A

GB 2250734 A

FR 002669184 A1

US 4645099 A

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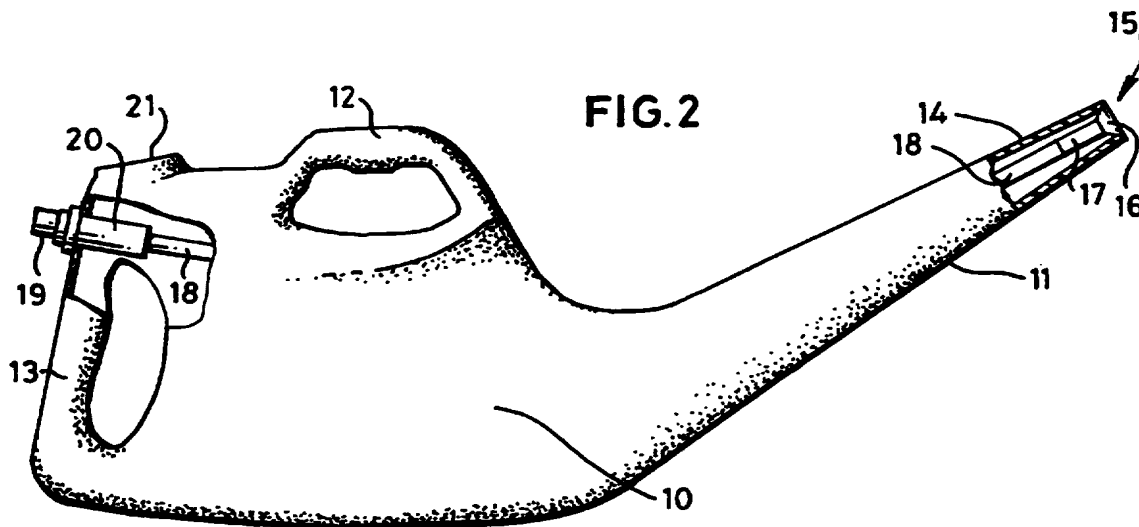
TWG TWH TWR TWX

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(54) **Watering can with valve to control liquid discharge**

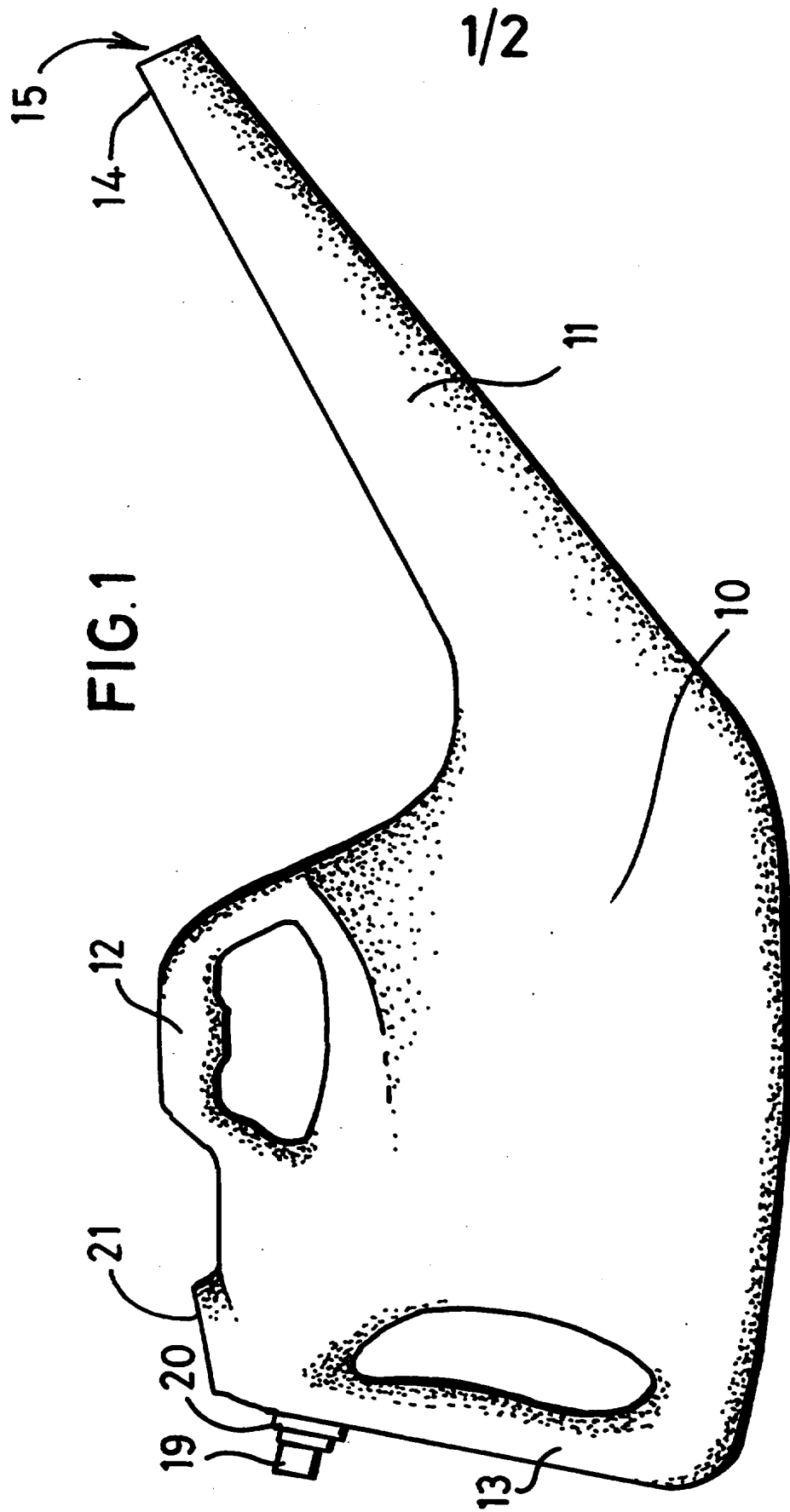
(57) A watering can has a main body 10 and a spout 11 projecting away therefrom. A valve 15 is provided at the free end of the spout and is operable by depressing a button 19 provided adjacent a handle 13 of the main body. The valve is connected to the button by means of a substantially rigid link to give direct control over the opening of the valve. A spring is arranged to bias the valve to its closed position.



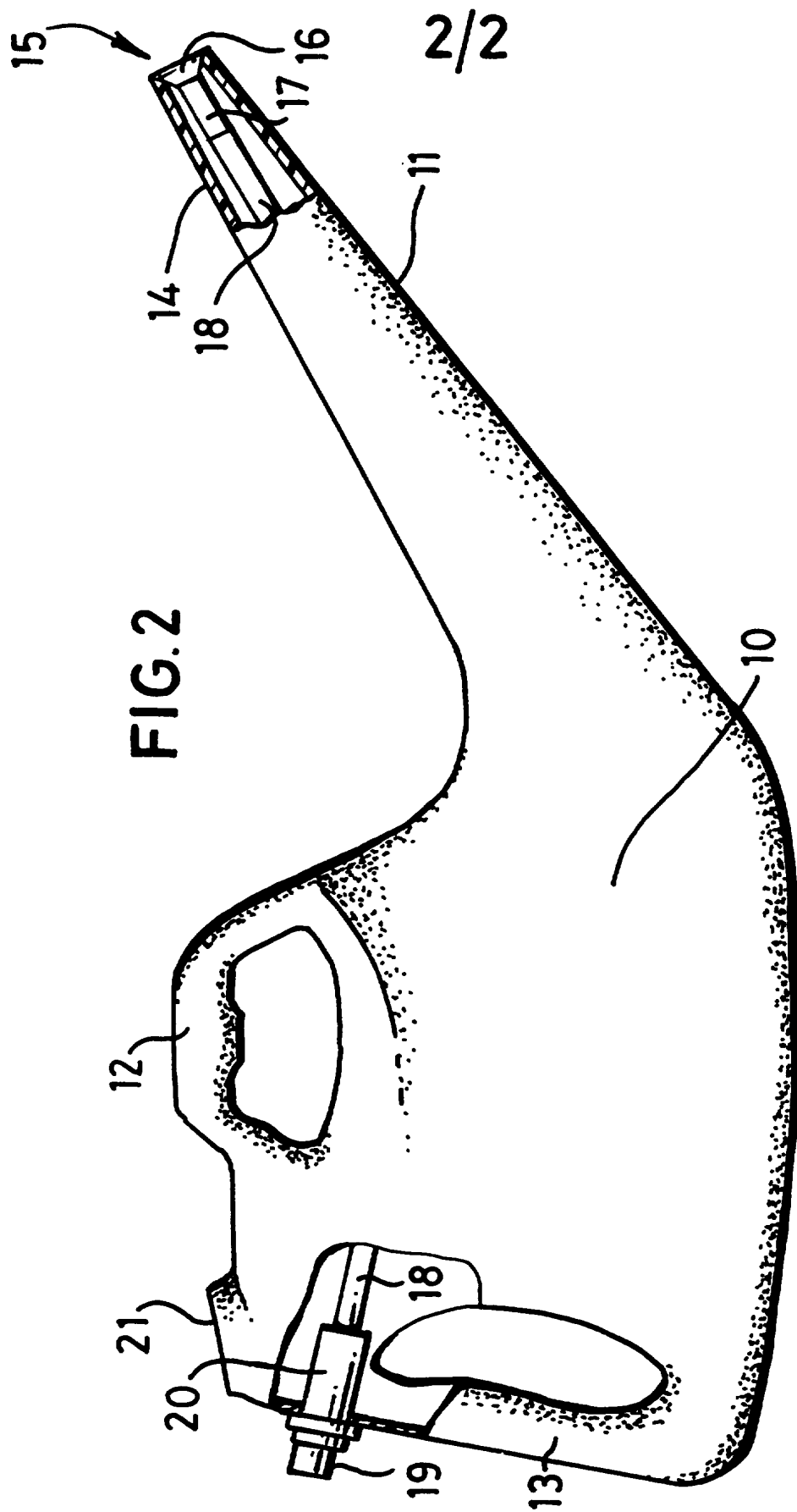
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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IMPROVEMENTS IN AND RELATING TO WATERING CANS

This invention relates to watering cans, and in particular concerns improvements to the watering can described in prior British Patent No.

5 2250734.

Watering cans are made in a wide variety of shapes and designs, have various capacities, and may be used with many different attachments for both indoor and outdoor use. The flow from most commercially available watering cans is controlled purely by gravity - that is to say, when the can is tipped
10 towards its spout, liquid contained in the can body (which liquid usually is water but may be liquid feed, pesticide, or some other liquid) will flow out of the spout, but when the spout is raised, the flow of water out of the spout is cut off.

In my prior British Patent No. 2250734, there is described an improved form of watering can having a valve in the spout, to permit the flow of water out
15 of the can to be controlled by suitable operation of the valve, once the can has been tipped. Trials and tests of this prior design of watering can have revealed certain deficiencies, particularly concerning the connection of the valve to an operating device by means of a nylon line or cord. The length of the line or cord must be adjusted to provide the tension required to hold the
20 valve tightly within the spout, but the required tension is difficult to judge, and tying a knot in the line once the required tension has been achieved often compromises the tension level. In turn, this has permitted the leakage of liquid, through the valve.

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The tension in the line or cord is also likely to be compromised over a period of use of the can. For example, when the can is being refilled, it frequently is forced against a tap, a part of which then lies inside the can. Should this part come into contact with the line or cord, the line or cord may be stretched, so affecting its tension, and therefore allowing the valve to become loose and leak water from the end of the spout.

A further problem has arisen with the prior design of watering can, following its prolonged use, or use in hot weather. It has been found there is a tendency for the valve to stick in its closed position despite depression of the operating member for the valve, which releases tension on the line or cord. Then, if the valve has stuck, on tipping the can the water pressure against the valve may cause the valve suddenly to open, releasing a rush of water. Sometimes, it is necessary for a user to touch or even knock the valve to release it, if the water pressure alone is insufficient to open the valve.

The present invention aims at reducing or eliminating these deficiencies in the design of watering can described in Patent No. 2250734. Accordingly, the present invention provides a watering can comprising a main body, a spout projecting away from the main body, and a handle portion by means of which the watering can may be held whilst discharging water out of the spout, which watering can further comprises a valve associated with the spout to control the out-flow of water therefrom, the valve having a movable valve member co-operable with a valve seat, an actuator for the valve positioned adjacent the handle portion and operable by a digit of a user's hand holding the handle, and

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an elongate valve-operating link extending between the actuator and the valve member, which said link is substantially inextensible and incompressible in the axial direction but is resiliently deformable transverse to said axial direction to permit the link to follow a curved path between the actuator and the valve member whilst still permitting the transfer of compression forces from the actuator to the valve member.

It will be appreciated that in the watering can of this invention, the operating link is essentially rigid in the length-wise direction and so can be cut to an exact length suitable for the dimensions of the watering can. The link does however allow limited flexing in a direction transverse to the length-wise direction, and so can be curved round within the watering can, to follow the optimum path from the actuator to the valve.

By having a direct and substantially incompressible link between the actuator and the valve member, the opening of the valve may accurately be controlled by applying the appropriate pressure to the actuator. If only a small pressure is applied, giving rise to a small movement of the actuator and so also of the valve member, the outflow of water from the spout will be relatively low despite significant tipping of the can. Conversely, by depressing the actuator through a greater distance, a greater outflow of water may be achieved. The valve may be resiliently biased to its closed position, to facilitate the stopping of the outflow of water. In this way, when the required volume has been delivered, the valve may be closed simply by releasing

pressure on the actuator, the resilient bias closing the valve and so cleanly cutting off the discharge of water.

The valve operating link may comprise a length of a solid rod or a tube of plastics material. Particularly if the operating link must be curved through a significant angle, it may be desirable to have a compound operating link
5 having several sections suitably joined together. Such sections need not be of the same material and so, for instance, the operating link may comprise a length of solid rod joined end-wise to a more flexible tube.

Though it would be possible for the operating link to extend externally of
10 the can, between the valve and the actuator, in the preferred embodiment the operating link extends through the spout from the valve and then through the main body of the can to a position adjacent the actuator. Typically, the spout adjoins the main body at or adjacent a lower or base wall of the can and the actuator is adjacent an upper part of the handle portion. In this case, the link
15 may follow a gently curved path through the main body and into the spout.

Conveniently, the actuator comprises a push-button directly connected to the valve operating link. Such a push-button may be slidably mounted to the can so as to extend through a wall of the main body.

In a preferred form of this invention, the valve seat is defined by the end
20 portion of the spout, remote from the main body. The valve member may generally be in the form of a poppet valve which co-operates with the valve seat, the stem of the poppet valve being connected to the operating link extending through the spout.

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By way of example only, one specific embodiment of watering can constructed and arranged in accordance with the present invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 shows the embodiment of watering can, fully assembled; and

5 Figure 2 shows the can of Figure 1, partially cut away for clarity.

The watering can shown in the drawings typically comprises a moulded plastics body 10 formed integrally with a spout 11 projecting away from a lower region of the body 10. Also formed integrally with the body 10 is a carrying handle 12 and a tipping handle 13. In use, but depending upon the volume of
10 the can, the can may be carried and used solely by grasping handle 13.

A valve 15 is fitted to the free end 14 of the spout 11. This valve comprises a poppet valve member having a head 16 and a stem 17, the head 16 co-operating with a valve seat defined by the periphery of the free end 14 of the spout. In the position illustrated in Figure 2, the valve closes the free end
15 of the spout but on moving the valve member outwardly with respect to the spout, the valve is opened and allows the outflow of liquid contained within the body 10.

The stem 17 of the poppet valve member is secured to a tubular operating link 18 extending through the spout and also through the body 10, to
20 an operating button 19 provided above the tipping handle 13. The operating link 18 is substantially incompressible along its length, though is sufficiently flexible to allow it to follow a curved path between the valve and the operating button. The button itself is slidably carried by a sleeve 20 mounted in a hole

formed through the wall of the can, to minimise friction and wear. A compression spring (not shown) is provided within the sleeve 20, to act between the sleeve and the button and to bias the button to the position shown in Figures 1 and 2, where the valve is in its closed position.

5 Depression of the button 19 against the action of the compression spring drives the poppet valve member to its open position. On releasing the button, the spring will close the valve. It will be appreciated that an operator grasping the tipping handle 13 may conveniently use his thumb to depress the button 19 to the required extent, to give an appropriate liquid outflow rate for
10 the watering activity being performed.

 The watering can illustrated in the drawings has a filling aperture 21 disposed generally above the tipping handle 13. On filling the can, even if a nozzle part of a tap contacts the sleeve 20 or link 18, damage to either component is most unlikely and so reliable operation of the valve may be
15 assured.

 The can illustrated in the drawings is merely one example of the kind of can to which the valve arrangement of this invention may be applied. The controllable valve would work equally well with a short spout watering can. Moreover, the overall shape, configuration and volume of the can and its spout
20 may take any useful form, having regard to the watering activity which is to be performed. The button may be replaced by a trigger or other operating lever. Whatever the form of the actuator for the valve, it may be located in a recess

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in the wall of the can, to minimise the risk of damage and possibly also to facilitate the operation thereof.

Though the valve is shown as having a valve seat defined by the free end of the spout, the invention would work equally well with a separate valve
5 unit defining the valve seat and valve member, and which unit is connected in a suitable manner to the end of the spout or is mounted at some point along the length of the spout, in a sealing manner.

CLAIMS

1. A watering can comprising a main body, a spout projecting away from the main body, and a handle portion by means of which the watering can may
5 be held whilst discharging water out of the spout, which watering can further comprises a valve associated with the spout to control the out-flow of water therefrom, the valve having a movable valve member co-operable with a valve seat, an actuator for the valve positioned adjacent the handle portion and operable by a digit of a user's hand holding the handle, and an elongate valve-
10 operating link extending between the actuator and the valve member, which said link is substantially inextensible and incompressible in the axial direction but is resiliently deformable transverse to said axial direction to permit the link to follow a curved path between the actuator and the valve member whilst still permitting the transfer of compression forces from the actuator to the valve
15 member.
2. A watering can as claimed in claim 1, wherein the valve-operating member comprises, or includes a length of, one of a solid rod or a tube of a plastics material.
3. A watering can as claimed in claim 1 or claim 2, wherein the valve
20 operating member extends through the spout from the valve and through the main body of the can to a position adjacent the actuator.
4. A watering can as claimed in claim 3, wherein the spout adjoins the main body at or adjacent a lower or base wall thereof and the actuator is

adjacent an upper part of the handle portion, with the link following a curved path between the actuator and the valve.

- 5 5. A watering can as claimed in any of the preceding claims, wherein the actuator comprises a push-button directly connected to the valve-operating link.
6. A watering can as claimed in claim 5, wherein the push-button is slidably mounted to extend through a wall of the main body of the watering can.
7. A watering can as claimed in any of the preceding claims, wherein the
10 valve is provided at the free end of the spout, remote from the main body of the watering can.
8. A watering can as claimed in claim 7, wherein the valve seat is defined by the end portion of the spout and the valve member co-operates with said end portion to form the valve.
- 15 9. A watering can as claimed in any of the preceding claims, wherein spring means are provided to bias resiliently the valve member to its closed position.
10. A watering can as claimed in claim 1 and substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.



Application No: GB 9718734.8
Claims searched: 1-10

Examiner: Lawrence Cullen
Date of search: 19 November 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): A4A (AK); B8D (DCF5, DCF8); B8T (TWH, TWG, TWR, TWX)
Int Cl (Ed.6): A01G 25/14; B65D 47/24
Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A, P	GB 2,306,151 A (ARNOLD) see entire document	--
A	GB 2,250,734 A (BONE) see entire document	--
A	FR 2,669,184 A1 (EXEL GSA) see Figures 1, 4 and 5 and lines 3-15, page 5	--
A	US 4,645,099 (GILLISPIE et al.) See Figures 1 and 2 and lines	--

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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